Warrnambool City Council

Botanic Precinct

Local Area Traffic Management Plan

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Information Page

DATE: 22/06/2021

CLIENT: Warrnambool City Council

REPORT NUMBER: S20190248

QUALITY RECORD:

Issue	*Date*	*Description*	*Prepared By*	*Reviewed By*	*Approved By*
1	22/06/2021	First Draft	Jamie Robertson John Poynton	Kenn Beer	
2	12/08/2021	Issued for Consultation	Jamie Robertson	Kenn Beer	
3	27/02/2022	Issued for Consultation	Jamie Robertson	Kenn Beer	

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ACN: 164 341 084 ABN: 98 164 341 084 Industry Code: 99994
Professional Indemnity Insurance Policy Number: 201908-0659 R1 BIA
Public Liability Insurance Policy Number: 15T2402729
Victorian WorkCover Policy Number: 14074213

Executive Summary

Safe System Solutions Pty Ltd has been requested by Warrnambool City Council Ltd to prepare a Local Area Traffic Management Plan for the Botanic Precinct, bounded by Raglan Parade, Ardlie Street, Jamieson Street/Queens Road and an area 500 metres north of Botanic Road.

Objectives - key objectives of the LATM study are to:

1. use existing data and the community consultation to determine traffic and safety issues for all users
2. assess the suitability of parking arrangements and traffic management, including pedestrian and cycling access and safety
3. develop a plan to address identified issues including parking, congestion, safety, high vehicle speeds/volumes, walking and cycling
4. propose innovative cost-effective solutions to traffic and parking issues, which may include park and walk options and must consider the impact on traffic in the precinct.

Methodology - the study methodology included:

- a review of conditions in the Botanic Precinct based on traffic and crash data and site inspections
- a community and stakeholder consultation to understand local concerns and priorities and gather ideas for improvement
- establish a list of issues and opportunities
- draft a Local Area Traffic Management Plan

Issues and Opportunities - the study identified issues and opportunities that can be grouped under four broad themes:

1. Pedestrian safety and connectivity, including:
    a. lack of footpath connectivity on some sections of the Principal Pedestrians Network (PPN), and popular drop-off/pick-up points for school
    b. lack of pedestrian crossings at many locations on the PPN and where there are pedestrian crossings, none give priority to pedestrians at all times of the day
    c. safety at school crossings could be further improved if they were upgraded to raised crossings.

2. Cyclist safety and connectivity, including:
    a. lack of connectivity at some locations
    b. many intersections on the Principal Bicycle Network are roundabouts, which are typically problematic for cyclists to navigate
    c. some cycle lanes are obstructed by parked or queuing vehicles

3. Traffic and Speed Management
    a. high traffic volumes at school drop-off and pick-up times with disruption to traffic flow, localised congestion and an increase in exposure to crash risks
    b. insufficient parking/stopping capacity at school drop-off/pick-up times aggravates congestion and risk issues
    c. some manoeuvres at the intersections with Botanic Road are difficult to execute at busy periods

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   d. speed compliance is generally good within the study area, although there may be an issue with speeding on Canterbury Road
   e. the existing speed limit is excessive and does not support the safe movement of vulnerable road users, especially on Botanic Road

4. Parking
   a. parking and stopping facilities are insufficient to meet very high demand at school drop-off and pick up times
   b. vehicles often stop or park inappropriately with consequent adverse impacts on traffic flow, safety and general amenity
   c. some parking restrictions are not effective or are being ignored

Local Area Traffic Management Plan – based on the issues and opportunities identified, a draft LATM Plan was developed and includes:

- 39 individual recommended improvements/treatments, and alternative treatments which may be deployed as interim measures or if there are insufficient resources to deliver the preferred treatment
- Treatments have been grouped according to their primary purpose, however all treatments are likely to serve multiple purposes. For example, parking improvements will improve traffic conditions by removing disruption to traffic flow and will promote more active transport.
- Whilst all treatments (individually) will provide benefits, the best results accrue when all/multiple treatments are implemented, because they are complementary

See Section 6 for the Local Area Traffic Management Plan and list of treatments.

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1 Background

Safe System Solutions Pty Ltd has been requested by Warrnambool City Council Ltd to prepare a Local Area Traffic Management Plan for the Botanic Precinct. The study area, shown in Figure 1, is bound by Raglan Parade (footpath on north side, excluding intersections), Ardlie Street, Jamieson Street/Queens Road and an area 500 metres north of Botanic Road.

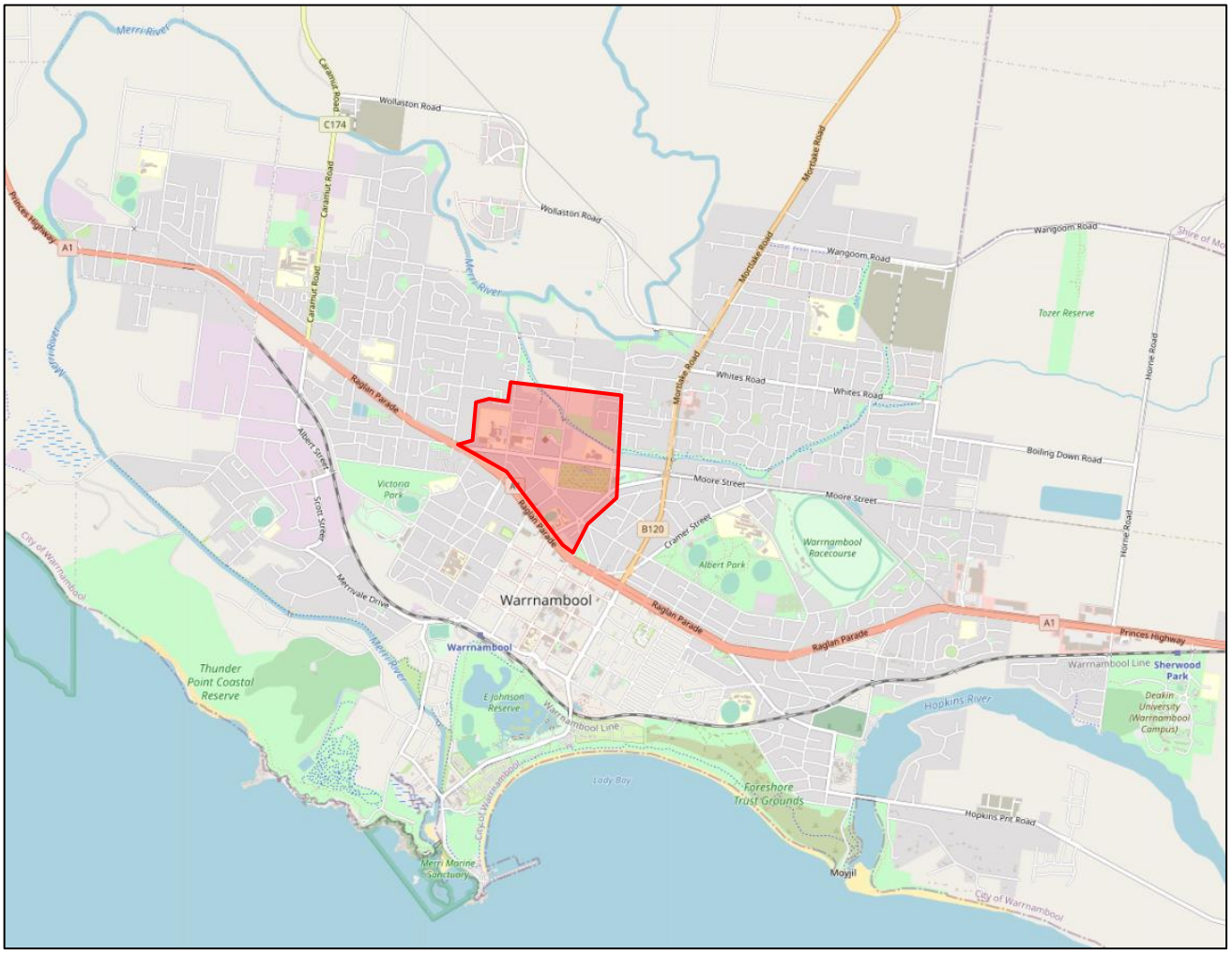

Figure 1: Warrnambool Botanic Precinct study area

This study is in response to growing safety concerns in the precinct due to pressure on parking, mixed traffic (cars, buses, walkers and cyclists), traffic congestion and pedestrian and cyclist access. Council is looking to develop an overall plan for the Botanic Precinct to manage traffic needs (including pedestrian and cycling access), parking requirements, protect residential amenity and to meet the needs and requirements of people travelling to commercial properties, schools, residential properties and open space.

Key objectives of the LATM study are to:

1. use baseline data and the community consultation to identify and assess resident, business, school and trader traffic concerns and to determine safety or congestion issues in the study area
2. review parking and transport conditions and assess the suitability of parking arrangements and traffic management, including pedestrian and cycling access and safety
3. develop a plan that addresses identified parking and transport issues, including safety, congestion, high speeds/volumes, walking and cycling issues, and possible park and walk opportunities
4. investigate and propose innovative cost-effective solutions to traffic and parking issues, which may include park and walk options and must consider the impact on traffic in the precinct.

This report describes:

- the study methodology
- existing conditions in the Botanic Precinct based on:
    - traffic and crash data
    - site inspections
- community and stakeholder consultation based on:
    - contributions from the local community
    - contributions from council and road safety partners
- issues and opportunities
- draft Local Area Traffic Management Plan.

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2 Methodology

2.1 Data Analysis

A desktop review of traffic, parking and crash data was conducted to understand how the network was working for all users. Key data sources included:

Data provided by Council

- Traffic data
    - traffic volumes and traffic generation for different zones in Warrnambool
    - vehicle speeds and composition
- Crash statistics
    - crash data over a five year period from 2016 to 2020
- Known traffic behaviours and community concerns
- Traffic management devices, and pedestrian and cyclist facilities
- Existing parking conditions – on and off road parking bays and occupancy

2.2 Site Investigations

Multiple site investigations were conducted at different times of the day, including peak periods, and in different weather conditions. Investigations involved on-foot inspections and driving the study area to experience site conditions and collect photographs and dash-cam film footage. The information collected was used to supplement the desktop data and provided a deeper understanding of:

- Vehicle movements - including volume, direction and speed of traffic; and turning movements
- Intersections – including how intersections are negotiated by all users
- Pedestrian facilities and behaviours – including footpaths and road crossing points; and how pedestrians use the rest of the network
- Cycle facilities and behaviours – including dedicated cycle facilities (such as cycle/shared paths) and how cyclists use the rest of the network
- Parking – including use of parking facilities, informal parking, pick-up and drop-off activities.

Site investigations were also critical for identify realistic and practical treatments and interventions.

2.3 Stakeholder Input

Council, as managers of the local road network, provided valuable input with local knowledge of the site, an understanding of road user behaviour and expertise in road network issues. Key data and information provided by Council over and above that described in section 2.1, included:

- Inventory of background documents that may influence decision making, including various policies, strategies, plans and reports relevant to traffic management, road safety, Movement and Place and related planning issues.

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- Council's understanding of current issues in the precinct, particularly relating to traffic (congestion), road safety and parking. This understanding comes from experience and observations whilst managing the network, historical investigations/audits/reports conducted for Council, and from community feedback.
- Aspirations for the precinct based on Council strategies and plans - in particular to encourage and prioritise sustainable transport against a backdrop of population growth and increasing demands on the network.

2.4 Community Consultation

The community was invited to have its say through two engagement channels.

Online Feedback

The community was invited to have its say via a survey on the council website, prompted by a letter drop to two hundred residents. Responses included feedback on what is working well, the biggest challenges involved in moving around the neighbourhood and suggestions for improvements

Community Workshops

Two community engagement workshops were also held to explore issues in greater detail:

- Workshop 1 – explained the purpose of the project, invited the community to identify issues that needed to be addressed, and explored potential ways of addressing those issues
- Workshop 2 – discussed potential improvement projects and identified critical success factors, risks and/or any other ideas that merited consideration

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3 Botanic Precinct – Existing Conditions

3.1 Road Network

Roads and streets in the study area are described in Appendix A. The study area includes:

Link Roads – which carry the heaviest volumes of traffic on the local (council) road network, including commercial vehicles, and provide the principal routes for traffic flows in and around the municipality. The link roads within the precinct are Botanic Road and Jamieson Street. Botanic Road is a key east-west corridor that connects the Princes Highway (Raglan Parade) to the Hopkins Highway, while Jamieson forms part of a key route connecting northern Warrnambool and the Warrnambool CBD.

Collector Roads – which carry significant volumes of traffic on the local (council) road network and provide access by connecting residential areas to the link roads. They also provide links between arterial roads. Collector Roads within the precinct are Ardlie Street, Bromfield Street, Queens Road and Canterbury Road. These roads are generally north-south orientated and provide connections to the link roads.

Access Roads – carry moderate volumes of traffic on the local (council) road network and primarily serve as property access roads for the local community.

Generally, most of the roads referred to in this report have one lane in each direction and footpaths. However, the network includes many different road characteristics:

- Some roads serve dual functions (dependent on location)
- There are 40, 50 or 60 km/h speed limits and many school zones (time limited 40 km/h)
- Some roads and intersections have cycle facilities

Most of the intersections for the main roads listed above are single lane roundabouts, except the intersections of Jamieson Street / Queens Road and Canterbury Road / Botanic Road which are priority-controlled 'T' intersections.

Kepler Street, Jamieson Street and King Street meet Raglan Parade at signalised intersections, while Botanic Road and Ardlie Street intersect Raglan Parade at unsignalised intersections. These intersections fall outside the study area but have a significant influence on traffic movement through the precinct.

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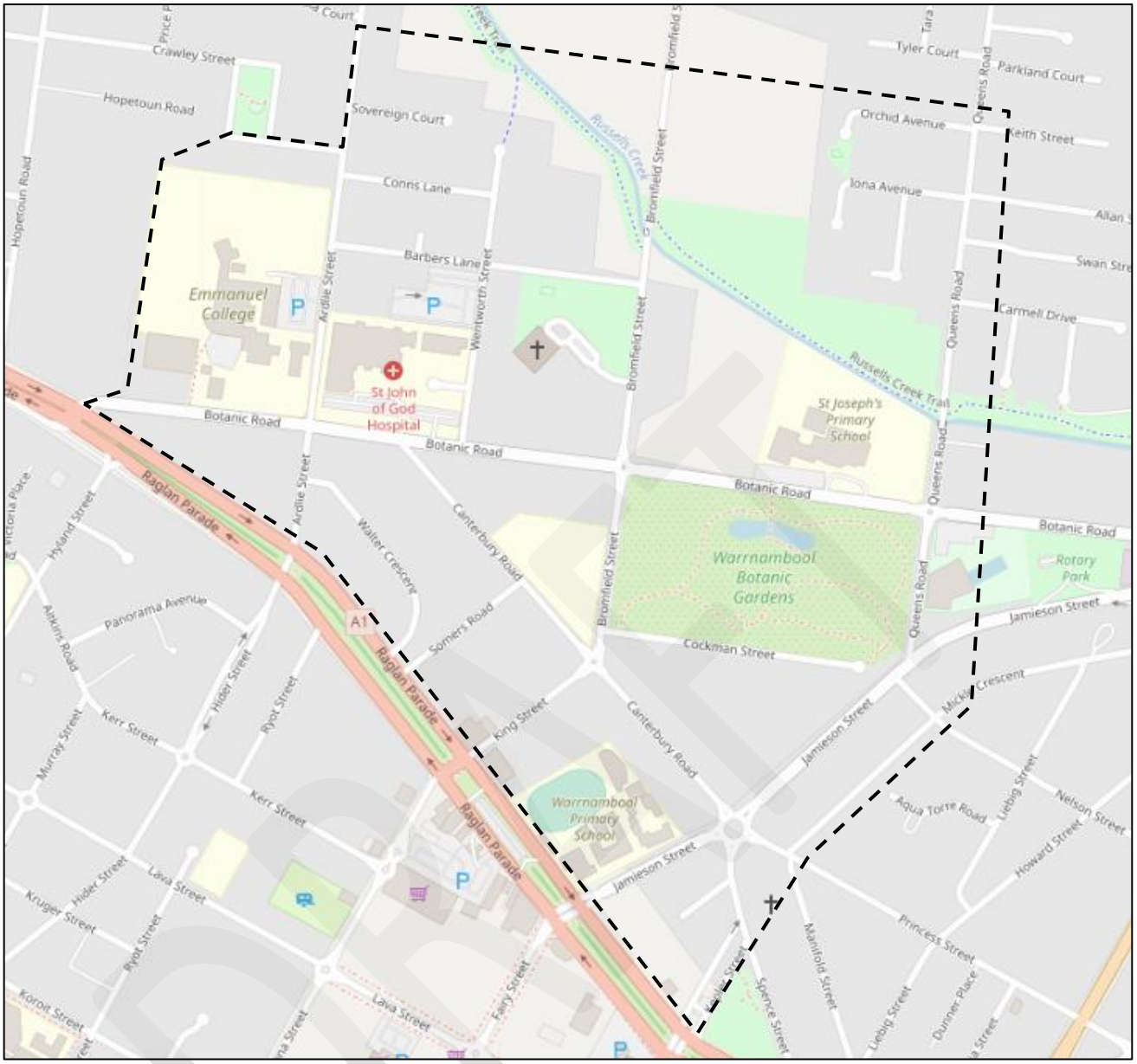

Figure 2: Warrnambool Botanic Precinct road network

3.2 Traffic Data

Traffic volumes and speed data collected by Council at various times between 2012-19 are shown in Table 1. Vehicles counts have been rounded to nearest 100 vehicles.

Table 1: Traffic count summary

Road	Hierarchy	24hr Vehicle Count	% Trucks	Speed Limit (km/h)	85% Speed (km/h)
Ardlie Street	Access/collector	1800 - 2000	5%	50	48
Botanic Road	Link	4000 - 6400	6%	60	49-60
Bromfield Street	Access/collector	2700-3400	4%	50	N/A
Jamieson Street	Link	2300-6800	5%	50	48
Queens Road	Access/collector	2200-2800	5%	50	37
Canterbury Road	Collector	3200	5%	50	54

Note about data:

- Vehicle counts show the range for counts over multiple years.
- Data has been averaged across multiple lengths of road, and rounded, to enable quick and easy comparison of roads.
- N/A = not available

A high level view of the traffic data alone shows that the roads are operating broadly in line with their functional requirements for vehicular traffic, with high volumes on link roads and lower volumes on access/collector roads.

Speed limits reflect the function of the roads – higher on links than on access/collector roads. It is noted that there are two speed limits on Canterbury Road (40 km/h and 50 km/h) and that there a are high number of school zones.

With regard to vehicle speeds, the 85th percentile speed is below the speed limit for all of the roads within the study area, except Canterbury Road where speeding may be an issue.

Speed limits increase from 50 km/h to 60 km/h on Ardlie Street, Bromfield Street and Queens Road outside the northern extent of the study area (Barbers Lane and Carmell Drive) and the 85th percentile speed slightly exceeds the speed on these sections of road.

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3.3 Crash Data

Crash data for the 5 year period 2016-20 was analysed and crash locations and types are shown in Figure 3.

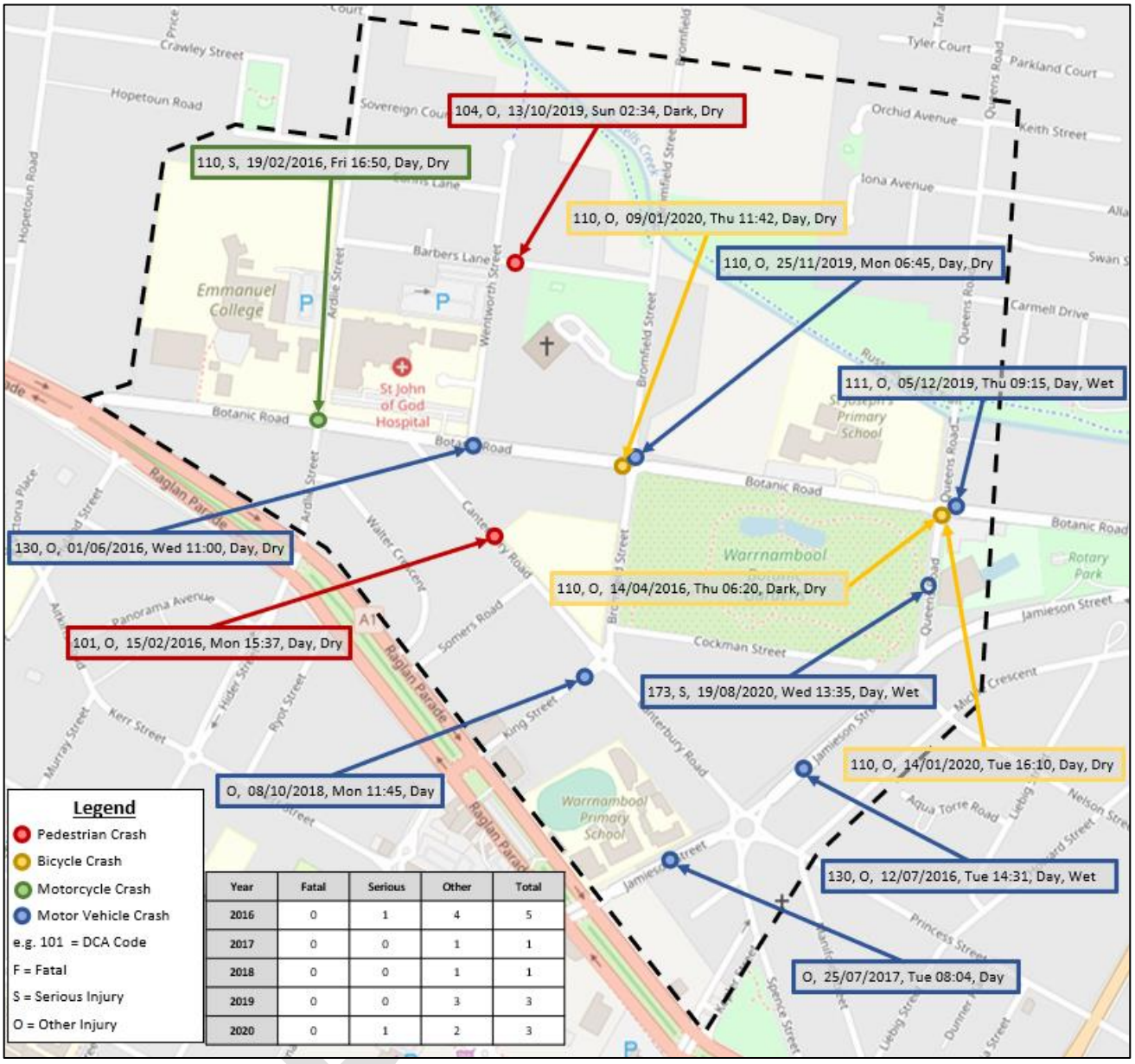

Figure 3: Crash Map

The data showed:

- There were 13 recorded all injury crashes in the five year period, fairly evenly dispersed across the study area
- About half of the crashes (7) occurred on Botanic Road
- No fatalities
- Two serious injuries, one on Botanic Road and one on Queens Road
- Two pedestrian crashes resulting in 'other' injuries

- On Barbers Lane, local to Wentworth Street an intoxicated pedestrian was struck walking roadside
- On Canterbury Road, local to Somers Road a pedestrian was struck crossing the road

- Three bicycle crashes at roundabouts resulting in 'other' injuries
  - At Botanic Road and Bromfield Street roundabout, there was a failure to give way
  - For both crashes at Botanic Road and Queens Road roundabout, there was a failure to give way
- One motorcycle crash resulting in 'serious' injury
  - At Botanic Road and Ardlie Street roundabout, there was a failure to give way

3.4 Roads Infrastructure and Parking

3.4.1 Pedestrian Facilities

A draft 'Principal Pedestrian Network' (PPN) for the study area is shown in Figure 4. Within the PPN, primary pedestrian routes provide a high level of pedestrian priority and are a major focus for the implementation of future walking infrastructure improvements. Secondary pedestrian routes are also important, but are allocated a slightly lower level of priority for planning purposes.

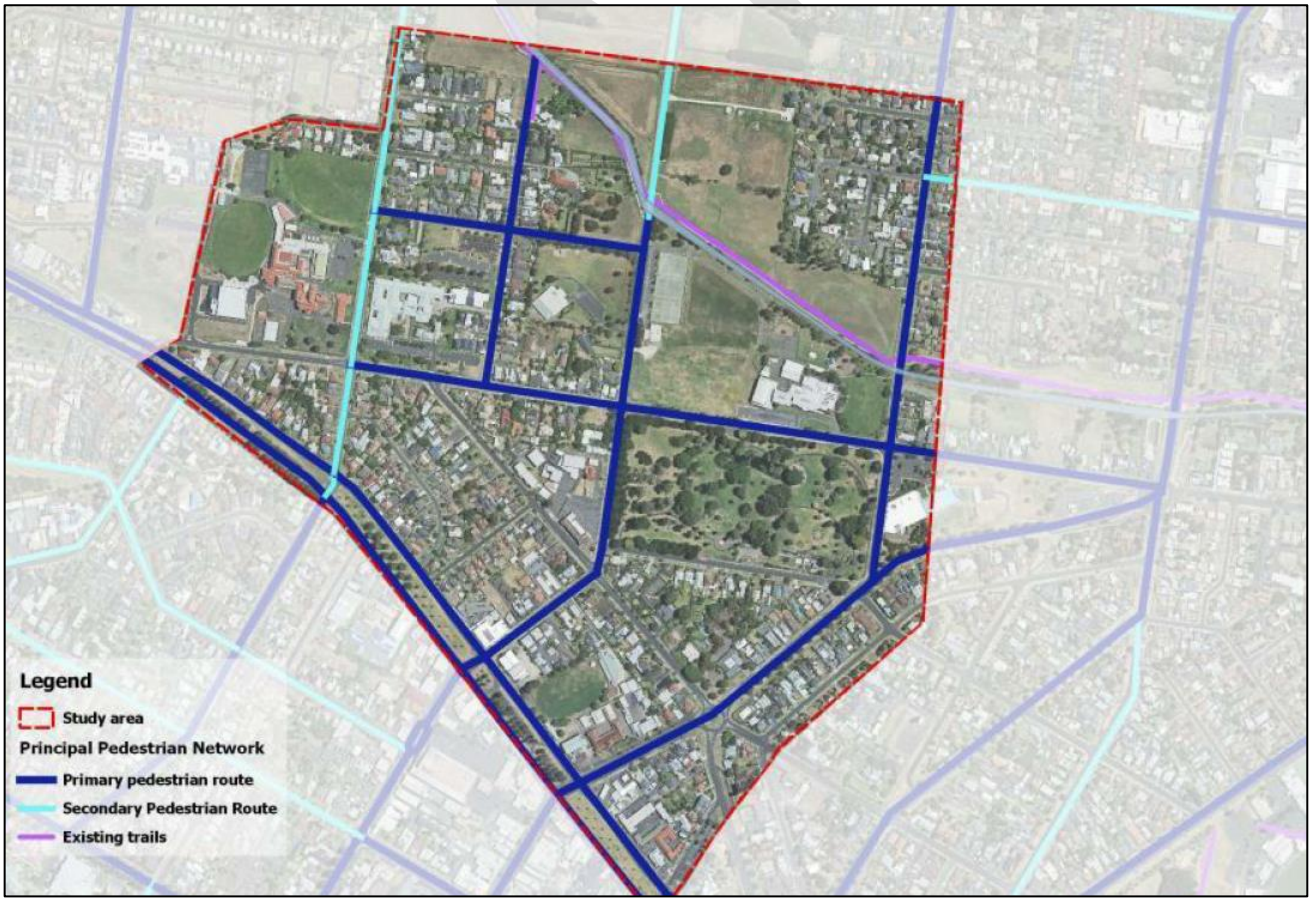

Figure 4: Principal Pedestrian Network

Observations from site investigations relating to the pedestrian network:

- Ardlie Street – secondary route
  - There is no footpath on the east side of Ardlie Street north of the bus stop at Emmanuel College
- Botanic Road – primary route
  - Although a primary route, there is no footpath adjacent to the Botanic Gardens
- Bromfield Road – primary route
  - Although a primary route, there is no footpath on the east side of Bromfield Road north of Botanic Road.
- Raglan Parade – primary route
  - There are no measures to assist pedestrians crossing Ardlie Street (at Raglan Parade)
- Crossing points
  - Aside from school crossings there are limited formal crossing facilities within the study area. Many of the road intersections on the Principal Pedestrian Network are roundabouts, which are typically problematic for pedestrians to navigate, especially children and the elderly.
  - Formal pedestrian crossings are located at:
    - Botanic Road, 60m west of Queens Road, school crossing (St. Joseph's Primary)
    - Ardlie Street, 40m north of Botanic Road, school crossing (Emmanuel College)
    - Bromfield Street, at Barbers Lane, school crossing (St. Joseph's Primary)
    - Jamieson Street, 100m from Raglan Parade, school crossing (Warrnambool Primary)
    - Jamieson Street, near Cockman Street, school crossing
    - Queens Road, at Russell Creek, school crossing (St. Joseph's Primary)
    - Canterbury Road, near Jamieson Street, school crossing (Warrnambool Primary)
    - Spence Street, near Jamieson Street, school crossing (Warrnambool Primary)
    - Russell Creek Trail crossings of Bromfield Street and Queens Road (refuge island only)

3.4.2 Cycle Facilities

A draft 'Principal Bicycle Corridor' (PBC) network for the study area is shown in Figure 5. Within the PBC, primary cycle routes provide a high level of cyclist priority and are a major focus for the implementation of future cycle infrastructure improvements. Secondary cycle routes are also important, but are allocated a slightly lower level of priority for planning purposes.

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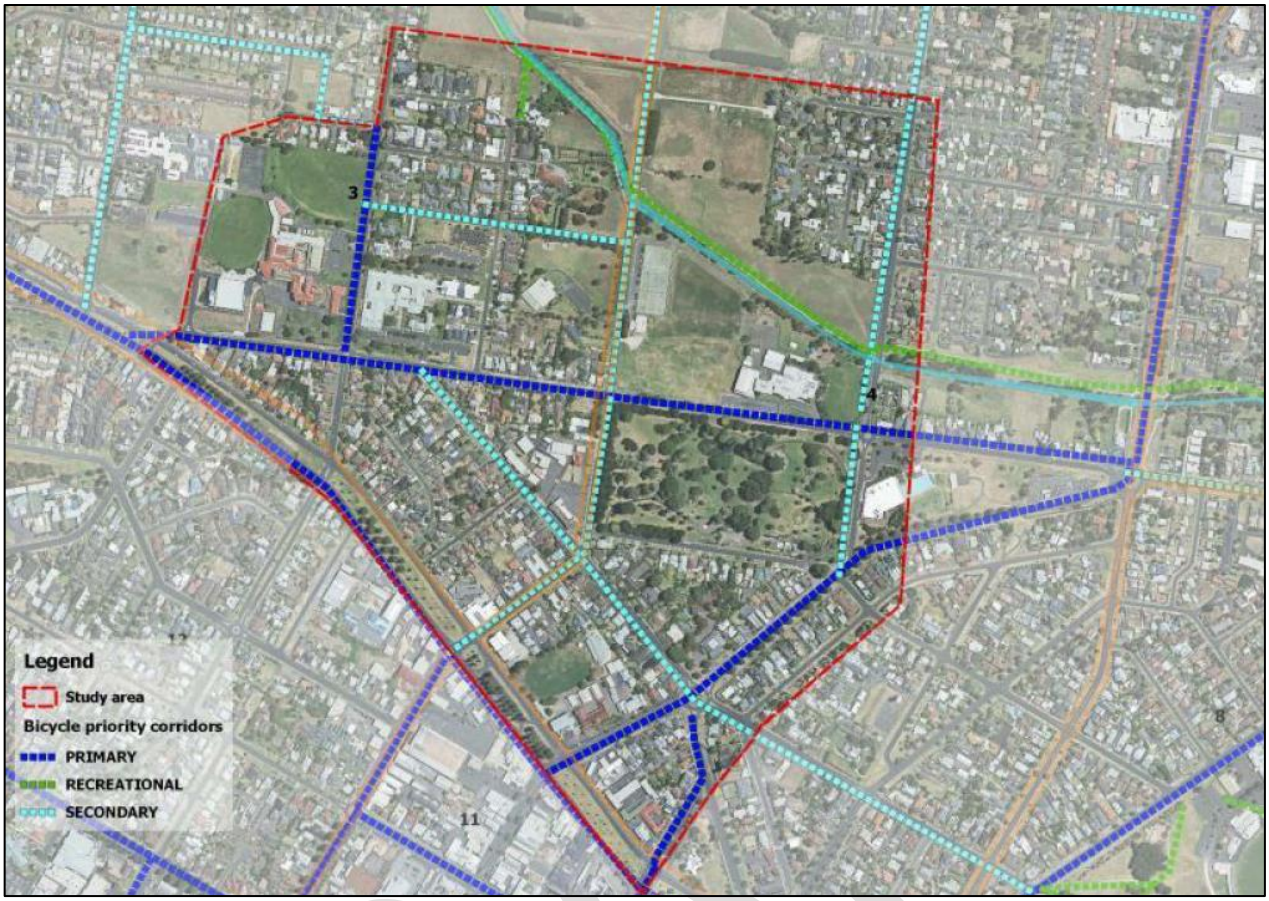

Figure 5: Principal Bicycle Corridor

Observations from site investigations relating to the cycle network:

- Ardlie Street – primary route
  - South of Botanic Road there are cycle lanes, but this section is not shown as a primary cycle route
  - North of Botanic Road is shown as a primary cycle route, although it does not have cycle lanes (or sharrows at the Ardlie Street/Botanic Road roundabout).
- Botanic Road – primary route
  - There are bicycle lanes on both sides for the full length
  - There is a shared path on the north side between Emmanuel College and Ardlie Street
- Bromfield Road – secondary route
  - There are no cycle lanes/paths
- Queens Road – secondary route
  - There are no dedicated facilities for cyclists
- Intersections
  - Many of the road intersections on the Principal Bicycle Network are roundabouts, which are typically problematic for cyclists to navigate. Where provided, cycle lanes do not continue through roundabouts, requiring cyclists to share space with general traffic. Sharrows are provided at some locations

- Cycle storage/parking
    - There are limited public cycle storage facilities within the study area. Some storage is provided at schools and facilities such as Aquazone

3.4.3 Public Transport

The No. 2 bus service – Warrnambool to Gateway Plaza - operates in the study area and links all three schools. It connects with the No.8 bus service - Warrnambool to Port Fairy – on Raglan Parade, local to Warrnambool Primary School. See Figure 6. Bus stops adjacent to the schools do not have bus shelters, except for Ardlie Street southbound adjacent to Emmanuel College.

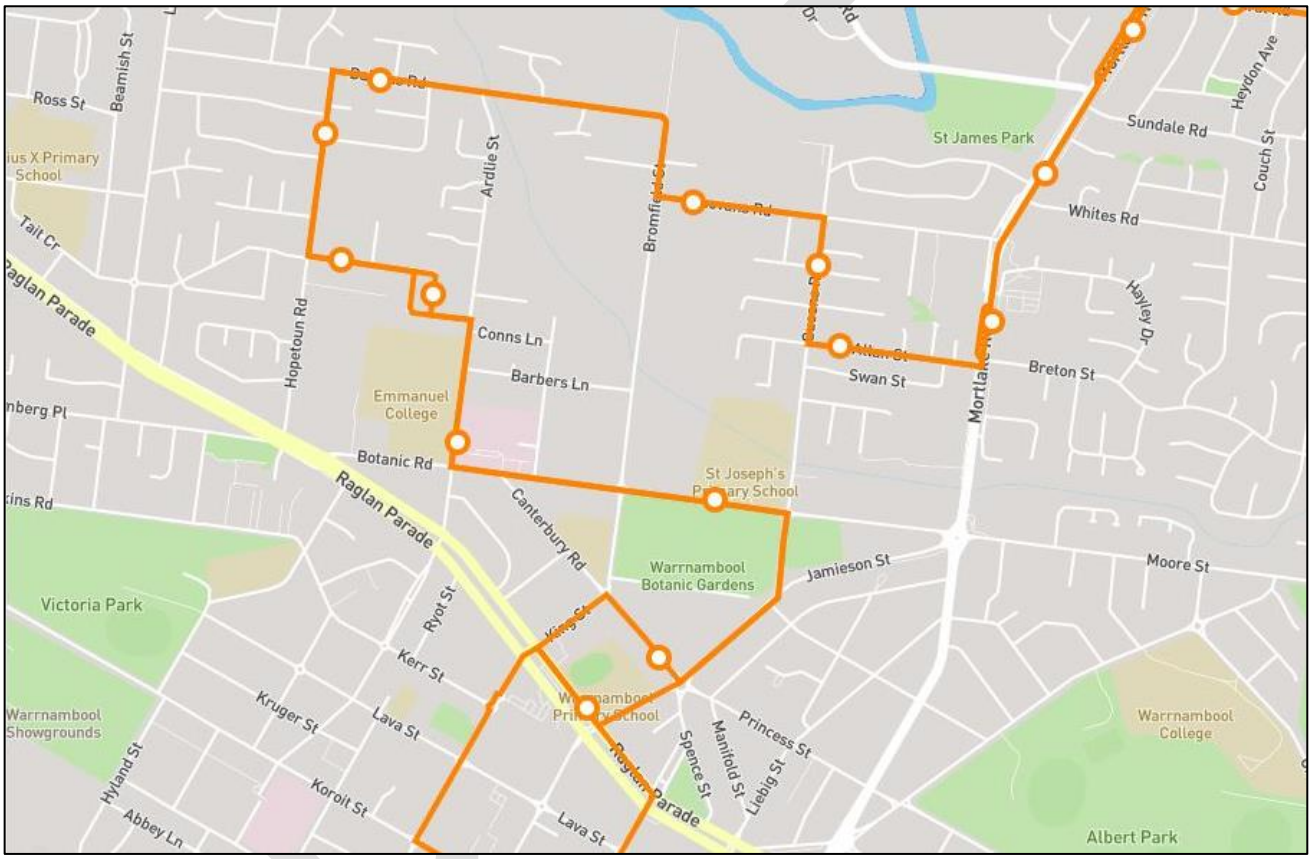

Figure 6: Bus Route (No.2)

3.4.4 Parking

The main parking facilities, including the location, number of parking bays and parking times/restrictions were investigated during the site investigations and parking bay occupancy counts (provided by council) were reviewed. Key points to note from the data and the site inspections are:

- A critical issue is parking capacity (and associated traffic movements) at the three schools in the study area. There is very high demand for parking at school drop-off and pick up times.
    - All parking and stopping areas are fully utilised
    - Vehicles are also stopping inappropriately on the road or roadside. This includes vehicles mounting the kerb to park on the nature strip or stopping at locations signed as 'No Stopping' areas.
    - Parking restrictions (e.g. ¼ hour) are in place at drop-off and pick-up times at some locations, while there are no restrictions in place at some popular drop-off / pick-up locations
    - Parking and traffic movements increase risks for road users and also disrupt traffic flows
    - Other parking facilities, such as facilities at Aquazone, are used for the school run
    - Barbers Lane is a popular pick-up point for Emmanuel College students
    - Bromfield Street including the parking area at the tennis courts is a popular pick-up point for families with children at both Emmanuel College and St Joseph's Primary School
- Students parking in streets during school times also compromise traffic movements and local amenity.

3.4.5 Activity Centres

The Botanic Precinct encompasses several large centres of activity, including:

Educational facilities

- Emmanuel College (Ardlie Street and Canterbury Road campuses)
- St Joseph's Primary School
- Warrnambool Primary School

Leisure facilities

- Botanic Gardens
- Aquazone

Health facilities

- St John of God Warrnambool Hospital

Other

- New Life Christian Church
- VicRoads Customer Service Centre

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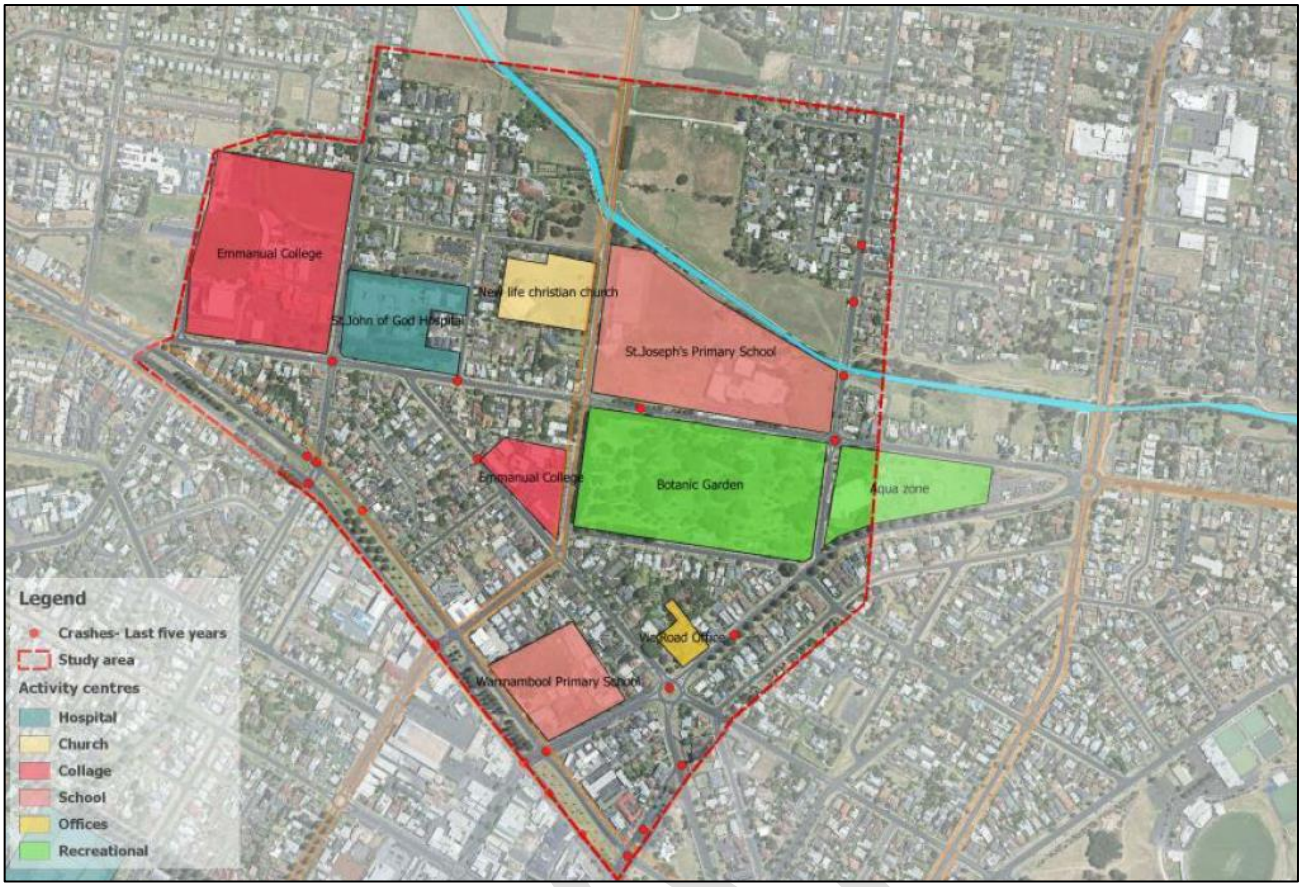

Figure 7: Botanic Precinct Activity Areas

Any traffic management plan must help to improve access, movement, safety and amenity - especially for pedestrians and cyclists. The plan should help to service the needs of the activity centres, as far as possible, whilst helping to integrate the centres into the local environment and community.

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4 Community and Stakeholder Consultation

The community was invited to have its say via a survey on the council website, prompted by a letter drop to two hundred residents. Responses included feedback on what is working well, the biggest challenges involved in moving around the neighbourhood and suggestions for improvements.

Two community engagement workshops were also held to explore issues in greater detail:

- Workshop 1 – explained the purpose of the project, invited the community to identify issues that needed to be addressed, and explored potential ways of addressing those issues
- Workshop 2 – discussed potential improvement projects and identified critical success factors, risks and/or any other ideas that merited consideration

Council established a Working Group of internal stakeholders with an understanding of current issues and aspirations for the precinct. This group provided input to the study based on knowledge and experience of managing the network and engaging with the community.

A summary of issues raised in the community engagement, including suggestions for improvement (when provided), is in Appendix B. This information was used to inform development of the recommendations and to align the recommendations as closely as possible with community expectations and aspirations. The main issues related to:

Walking

- Gaps in the footpath network
- Crossing roads safely at mid-block and roundabouts
- Connecting Emmanuel senior and junior campuses

Cycling

- Safety at roundabouts

Driving

- Difficult intersections

Parking

- Parking and stopping for school pick-up and drop-off
- Park and walk facilities
- Inappropriate parking

Public Transport

- Poor bus patronage

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5 Issues and Opportunities

This section of the report describes issues and opportunities within the study area. Whilst recommendations are presented in relation to specific objectives (e.g. improve access to school for students) it should be noted that they also deliver broader benefits to the community (e.g. improve safety for all pedestrians). Recommendations in this section are for a 'preferred' treatment, however alternative treatments may also be available and these are described in Section 6 – Treatments.

5.1 Pedestrian safety and connectivity

5.1.1 Issues

There is a lack of connectivity for pedestrians at some locations. This includes a lack of footpaths on some sections of the Principal Pedestrians Network (PPN), including sections which are already popular drop-off/pick-up points for school.

There are many locations on the PPN where there are no pedestrian crossings. Where there are pedestrian crossings, none give priority to pedestrians at all times of the day.

There are numerous supervised school crossings, however none of these are raised crossings. Raised crossings reduce vehicle speeds at the crossing point, improve visibility of pedestrians and have traffic calming benefits during and outside school times.

There is no safe crossing point on Botanic Road in the vicinity of St John of God Hospital, to facilitate pedestrian movements to the hospital and nearby schools as well as general pedestrian movements.

5.1.2 Opportunities

5.1.2.1 Warrnambool Primary School

There are opportunities to improve safety when crossing roads to access the school and include:

- Upgrade three of the four existing supervised school crossings in the vicinity of the school to raised school crossings on Jamieson Street (x2) and Canterbury Road
- Upgrade the existing school crossing on Spence Street to a raised school crossing and locate the crossing as close to the roundabout as practicable
- Install a new Wombat crossing on Princess Street at the Jamieson Street roundabout
- Install a raised threshold treatment on Nelson Street intersection with Jamieson Street

5.1.2.2 Emmanuel College

There are opportunities to improve safety when crossing roads to access the school, and to improve connectivity between the two campuses. These include the following.

To improve safety and connectivity between campuses:

- Install Wombat crossings on all four legs of Canterbury Road/Bromfield Street/King Street roundabout

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- Install Wombat crossing on Canterbury Road north of Somers Road
- Install raised threshold on Canterbury Road at Botanic Road
- Install Wombat crossing on Botanic Road east of Ardlie Street
- Upgrade the roundabout at Ardlie Street/Botanic Road to include enlarged central islands, kerb outstands and raised platforms/speed cushions
- Upgrade the existing supervised school crossing on Ardlie Street to a raised school crossing

To improve connectivity with Barbers Lane, which is a primary pedestrian route and may include 'park and walk' and/or drop-off points:

- Install new footpath on Ardlie Street (east side) between Botanic Road and Barbers Lane
- Install new pedestrian refuge island on Ardlie Street south of Barbers Lane

5.1.2.3 St Joseph's Primary School

There are opportunities to improve safety and connectivity which include:

- Upgrade existing school crossings to raised school crossings on Botanic Road (west of Queens Road) and Queens Road at Russell Creek Trail.
- Install a new Wombat crossing on Botanic Road between Bromfield Street and Queens Road to provide a safe connection to the school for pedestrians walking along Bromfield Street or through the Botanic Gardens.
- Upgrade the existing school crossing to a raised school crossing on Bromfield Street near Barbers Lane

  OR

  Retain the existing school crossing as is and install a new Wombat crossing at the nearby Russell Creek Trail crossing

  OR

  Combine the two crossing points and upgrade to a Wombat crossing (dependent on provision of a new path on the east side of Bromfield Street)

- Install new footpath on south side of Botanic Road adjacent to the Botanic Gardens between Bromfield Street and the bus stop west of Queens Road
- Upgrade the roundabout at Bromfield Street and Queens Road to include enlarged central islands, kerb outstands and raised platforms/speed cushions

5.1.2.4 Botanic Road

There are opportunities to improve facilities for pedestrians travelling along Botanic Road who need to cross intersecting roads or Botanic Road itself:

- Upgrade the roundabouts at Ardlie Street, Bromfield Street and Queens Road to include enlarged central islands, kerb outstands and raised platforms/speed cushions
- Install a threshold treatment on Wentworth Street at Botanic Road
- Install raised threshold treatment on Canterbury Road at Botanic Road

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- Install a raised pedestrian crossing on Botanic Road between Canterbury Road and Wentworth Street

5.1.2.5 Queens Road

There is an opportunity to connect Aquazone with Botanic Gardens (and St Joseph's Primary School):

- Install a new wombat crossing on Queens Road between Jamieson Street and Botanic Road

5.2 Cyclist safety and connectivity

5.2.1 Issues

There is a general lack of off-road bicycle facilities, and no off-road connections between the Russell Creek Trail and nearby schools and attractions.

Connectivity is lacking at some locations and many intersections on the Principal Bicycle Network are roundabouts, which are typically problematic for cyclists to navigate. All three bicycle related casualty crashes recorded between 2016-20 occurred at roundabouts. Where provided, cycle lanes do not continue through roundabouts, requiring cyclists to share space with general traffic. Sharrows are provided at some locations but not others.

Some cycle lanes are obstructed by parked or queuing vehicles which forces cyclists closer to traffic. This is a particular problem along Botanic Road which is a primary route on the Principal Bicycle Corridor.

5.2.2 Opportunities

5.2.2.1 Shared Paths

There are opportunities to separate cyclists from vehicular traffic and connect with other off-road facilities, particularly on the Principal Bicycle Corridor (PBC). These include:

- Install a new shared path on the east side of Bromfield Street between Botanic Road and Russell Creek Trail

5.2.2.2 On-road cycle facilities

Opportunities to improve on-road cycle facilities include:

- Install on-road cycle lanes (preferably separated) on Ardlie Road from Botanic Road to Barbers Lane and beyond. These would provide a continuation of the cycle lanes from Ardlie Road south of Botanic Road and a connection to the Russell Creek Trail to the north.

5.2.2.3 Intersections

There are opportunities to improve safety for cyclists, these include:

- Install sharrows at roundabouts that do not already have them:

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- Botanic Rd/Ardlie St (no sharrows), Botanic Rd/Bromfield St (currently provided on Botanic Rd approaches only),Botanic Rd/Queens Rd (currently provided on Botanic Rd approaches only), and Canterbury Rd/Bromfield St
- Sharrows should be provided on each approach as well as within the circulating carriageway

- Introduce traffic calming measures at roundabouts, including Botanic Road (see 5.1.2.4), Canterbury Road (5.1.2.2) and Jamieson Street (see 5.1.2.1)

5.2.2.4 Parking and Stopping

Opportunities to stop parked vehicles obstructing bike lanes on Botanic Road, include:

- Botanic Road (Raglan Parade to Ardlie Street) – ban parking
- Botanic Road, (Wentworth Street to Bromfield Street) - install indented parking on both sides
- Treatments to improve parking and stopping facilities at the St Joseph's to reduce queuing on the left turn lane (see Section 5.4).

5.3 Traffic and Speed Management

5.3.1 Issues

At school drop-off and pick-up times there is a significant increase in traffic volume, parking, stopping and pedestrian and cycle movements. This causes disruption to traffic flow, localised congestion and an increase in exposure to crash risks. These issues are most noticeable along Botanic Road and where casualty crashes have occurred they have been at the roundabouts – there has been at least one casualty crash (in the five year period 2016-20) at each of the intersections.

Insufficient parking/stopping capacity at school drop-off/pick-up times aggravates congestion and risk issues. Traffic backs up on the left turn lane into St Joseph's Primary School at drop-off/pick-up times, blocking the cycle lane and causing hold ups at Bromfield Street roundabout.

Some manoeuvres at the intersections with Botanic Road are difficult to execute at busy periods:

- Canterbury Road meets Botanic Road at an acute angle, sight distance to the east is restricted due to the crest in Botanic Road and access to St John pf God Hospital complicates traffic movements
- Wentworth Street has a steep upgrade approaching Botanic Road and sight distance is compromised by the crest in Botanic Road

Speed compliance is generally good within the study area, although speed data suggests that there may be an issue with speeding on Canterbury Road, which is a connecting route between the two Emmanuel College campuses and is also local to Warrnambool Primary school.

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5.3.2 Opportunities

5.3.2.1 Traffic Calming on Botanic Road

There is an opportunity to introduce safer speeds on Botanic Road, which currently has a 60 km/h speed limit along its entire length (excluding time-based 40 km/h school speed zones). Speed data indicates that 85th percentile speeds on Botanic Road are less than 60 km/h between Ardlie Street and Queens Road and are approximately equal to 60 km/h outside this section. A speed limit reduction to 50 km/h or less is proposed to improve safety for the large numbers of vulnerable road users present.

It is noted that a speed limit reduction may result in a small increase in travel times along Botanic Road at certain times, however the close spacing of existing traffic calming devices (roundabouts) together with traffic congestion means that many motorists do not reach the current posted speed limit.

Additional traffic calming measures on Botanic Road will help to smooth traffic flows and achieve safer vehicle speeds, especially at intersections where crash risks have been highest. Also removing some movements onto Botanic Road will reduce disruption to traffic flow and reduce risk. Improvement opportunities include:

- Upgrade the roundabouts at Ardlie Street, Bromfield Street and Queens Road to include enlarged central islands, kerb outstands and raised platforms/speed cushions
- Install raised pedestrian crossings as discussed in 5.1
- Ban right turn from Canterbury Road into Botanic Road (alternative routes are available)
- Ban right turn from Wentworth Street into Botanic Road (alternative routes are available)

A benefit of introducing traffic calming measures along Botanic Road will be that it becomes less attractive as an alternative route to the highway for motorists, particularly drivers of heavy vehicles, whose origins and destinations lie outside the study area. The design of traffic calming devices on Botanic Road and elsewhere will however need to be sympathetic to the needs of the many buses that travel within the precinct.

5.3.2.2 Traffic Calming on Canterbury Road

There are opportunities to introduce safer speeds on Canterbury Road, which has a 50 km/h speed limit east of Bromfield Road and a 40 km/h speed limit west of Bromfield Road. Opportunities include:

- Install treatments as previously listed in 5.1.2.2 - Wombat crossings on all four legs of Canterbury Road/Bromfield Street/King Street roundabout, Wombat crossing north of Somers Road, raised threshold at Botanic Road
- Change 50 km/h speed limit (east of Bromfield Road) to 40 km/h

5.3.2.3 Traffic Calming on Wentworth Street

If Barbers Lane is to be designated a school drop off point (see 5.4.2.5) then an additional safety treatment could include:

- Install a raised intersection at Wentworth Street/Barbers Lane

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5.3.2.4 Traffic Calming on Queens Road

There is an opportunity to improve safety on Queens Road by:

- Implementing one way operation on Queens Road. The decision on which direction of travel is permitted should consider traffic volumes, availability of alternative routes, the implications of the vertical grade on Queens Road, and the impacts of other LATM devices to be installed in the vicinity. A review of available data suggests that northbound is the predominant travel direction during both the morning and afternoon peak periods.
- Installing a raised pedestrian crossing (see 5.1.2.5)

5.3.2.5 Parking and Stopping

A critical treatment to improve traffic flow and safety (including at the St Joseph's left turn lane on Botanic Road) is improvement of parking and stopping facilities. These treatments are set out in the section 5.4.

5.3.2.6 Speed Zoning

Victorian speed zoning principles are based on five key themes and there are sound arguments for serious consideration of a speed limit review for the precinct. With a blanket 40 km/h speed limit in mind and looking briefly at each theme:

- Road Safety – reducing speed limits from 50 km/h and 60 km/h to 40 km/h will reduce the likelihood and severity of crashes.
- Transport Network Efficiency – A lower speed limit, over such a small area, will have a minimal impact on door to door journey times. There is a possibility that a lower limit may improve journey times, or at least smooth traffic flows, if there is less stop-start driving and travel behaviours change (e.g. more walking and cycling).
- Road User Expectation – a single speed limit would introduce consistency and would support the expected amenity value of the precinct. However, higher speed limits are the norm on roads of this type and user expectations would have to be managed. During the engagement exercise, the community raised the idea of a 40 km/h speed zone.
- Community Engagement – when determining a change in speed limit, engagement with the affected community and road users should be undertaken so that expectations and impacts are understood and considered.
- Community wellbeing – a 40 km/h speed zone would support active transport and amenity.

There is an opportunity to:

- Undertake a Speed Zoning Review in accordance with Victorian Speed Zoning Guidelines to determine the viability, desirability and extents of a 40 km/h speed zone in the study area.

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5.4 Parking

5.4.1 Issues

There is very high demand for parking at school drop-off and pick up times. Whilst the schools have some dedicated parking and stopping facilities they are not sufficient to meet demand. This means that vehicles often stop inappropriately with consequent adverse impacts on traffic flow, safety and general amenity.

Parking restrictions (e.g. ¼ hour) are in place at drop-off and pick-up times at some locations, while there are no restrictions in place at some popular drop-off / pick-up locations. Some drivers are ignoring parking restrictions, including stopping at locations signed as 'No Stopping' areas.

Students and teachers are using some local roads to park during school times, which may also compromise traffic movements and local amenity.

5.4.2 Opportunities

Parking treatments could be introduced to achieve the following aims:

- Enable more efficient and effective school drop-off points and 'Park and Walk' options, which will:
  - encourage more walking and walking along specific routes
  - reduce traffic disruptions and unsafe parking movements by locating parking in appropriate locations
  - reduce traffic disruptions, and disruptions to cycle lanes, using indented parking to keep traffic lanes clear
- Ensure that parking facilities are (generally) used for the purposes intended. For example, students park along the southern boundary of the Botanic Gardens which means that parking is not available for visitors to the Gardens.

The following treatments are recommended.

5.4.2.1 Botanic Road

- Raglan Parade to Ardlie Street – ban parking to stop parked vehicles from obstructing cycle lanes
- Wentworth Street to Bromfield Street - install indented parking on both sides to stop parked vehicles from obstructing cycle lanes
- Bromfield Street to bus stop west of Queens Road – install indented parking and school drop-off parking servicing St Joseph's Primary school (which can also serve Emmanuel College)

5.4.2.2 Canterbury Road

- Botanic Road to King Street – indented parking on one or both sides with school drop-off parking servicing Emmanuel College
- King Street to Jamieson Street – implement school drop-off parking on one or both sides, servicing Emmanuel College and Warrnambool Primary school

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5.4.2.3 Queens Road

- Botanic Road to Russell Creek Trail - implement school drop-off parking on west side, servicing St Joseph's Primary school

5.4.2.4 Bromfield Road

- Botanic Road to Barbers Lane - implement school drop-off parking on east side, servicing St Joseph's Primary school

5.4.2.5 Barbers Lane

- Wentworth Street to Bromfield Street – Install indented parking on north side with school drop-off/pick-up time restrictions servicing St Joseph's Primary school and serve Emmanuel College

5.4.2.6 Cockman Street

- North side – Implement parking restrictions (e.g. 2 hour limit) at the eastern end of Cockman Street to deter all day parking and free up spaces for visitors to the Gardens

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6 Proposed LATM Scheme

The following maps and tables show all of the proposed treatments described in Section 5 – which together constitute the draft LATM scheme. A few points to note:

- The treatments are shown in Figures 8-10. All three figures show the same treatments.
    - Figures 8 and 9 show a satellite image and a map (respectively), so that the reader can view whichever format is most helpful
    - Figure 10 numbers all of the treatments which are described in more detail in Table 2
- Table 2 describes recommended treatments and also alternative treatments (where appropriate). Generally speaking, the recommended treatments will be the most effective at meeting the objectives of the LATM plan. The identified alternative treatments are considered to be either less effective (but still worthwhile), able to be installed more easily and at lower cost, or unlikely to meet current warrants (eg. Wombat crossings at locations where pedestrian activity occurs largely at school times). In some cases, alternative treatments could be deployed as an interim measure until the recommended treatment is installed.
- Table 3 provides a high-level overview of a number of the proposed treatments, including their advantages and disadvantages.
- Appendix C includes photographic examples of a range of the proposed treatments.
- Treatments have been grouped according to their primary purpose, however all treatments are likely to serve multiple purposes. For example, parking improvements will improve traffic conditions by removing disruption to traffic flow and will promote more active transport.
- Whilst all treatments (individually) will provide benefits, the best results accrue when all/multiple treatments are implemented, because they are complementary.

6.1 Prioritisation of Treatments

The following treatments should be prioritised for implementation:

- Treatments that align with Safe System principles, such as raised pedestrian crossings and intersection treatments that reduce vehicle speeds to levels where the kinetic energy associated with foreseeable crash types is within the tolerable levels of the human body.
- Treatments that serve multiple purposes, such as raised pedestrian crossings which improve pedestrian safety whilst also providing traffic calming benefits.
- Treatments that provide important connections or complete missing links in the principal pedestrian and bicycle networks.
- Treatments that will directly address crash problems within the precinct, such as roundabout upgrades on Botanic Road.

As the proposed treatments are complementary, they should therefore be implemented in packages comprising multiple treatments where possible.

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Opportunities to attract external funding may also influence prioritisation of sites and treatment selection. Potential funding sources include the Federal Black Spot, Safe Travel in Local Streets and TAC Local Government Grants for Small Scale Infrastructure programs.

Another consideration is the impact that future changes to the road network and land usage, both within and surrounding the study area, may have on travel patterns and transport modes within the precinct. Such changes include:

- Upgrades to the intersection of Botanic Road and Raglan Parade – currently under investigation by Department of Transport
- Upgrades to the intersection of Ardlie Street and Botanic Road – currently under investigation by Department of Transport
- Future extension of Bromfield to the north in the longer term
- Movements to/from Emmanuel College – potential loop from Hopetoun Road to Botanic Road, relocation of students from Canterbury Road campus
- Potential school drop off zone in Raglan Parade median near Jamieson Street
- Potential upgrades to the intersection of Queens Road and Donovans Road.

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Figure 8: Warrnambool Botanic Precinct LATM Plan (satellite)

Figure 9: Warrnambool Botanic Precinct LATM Plan (map)

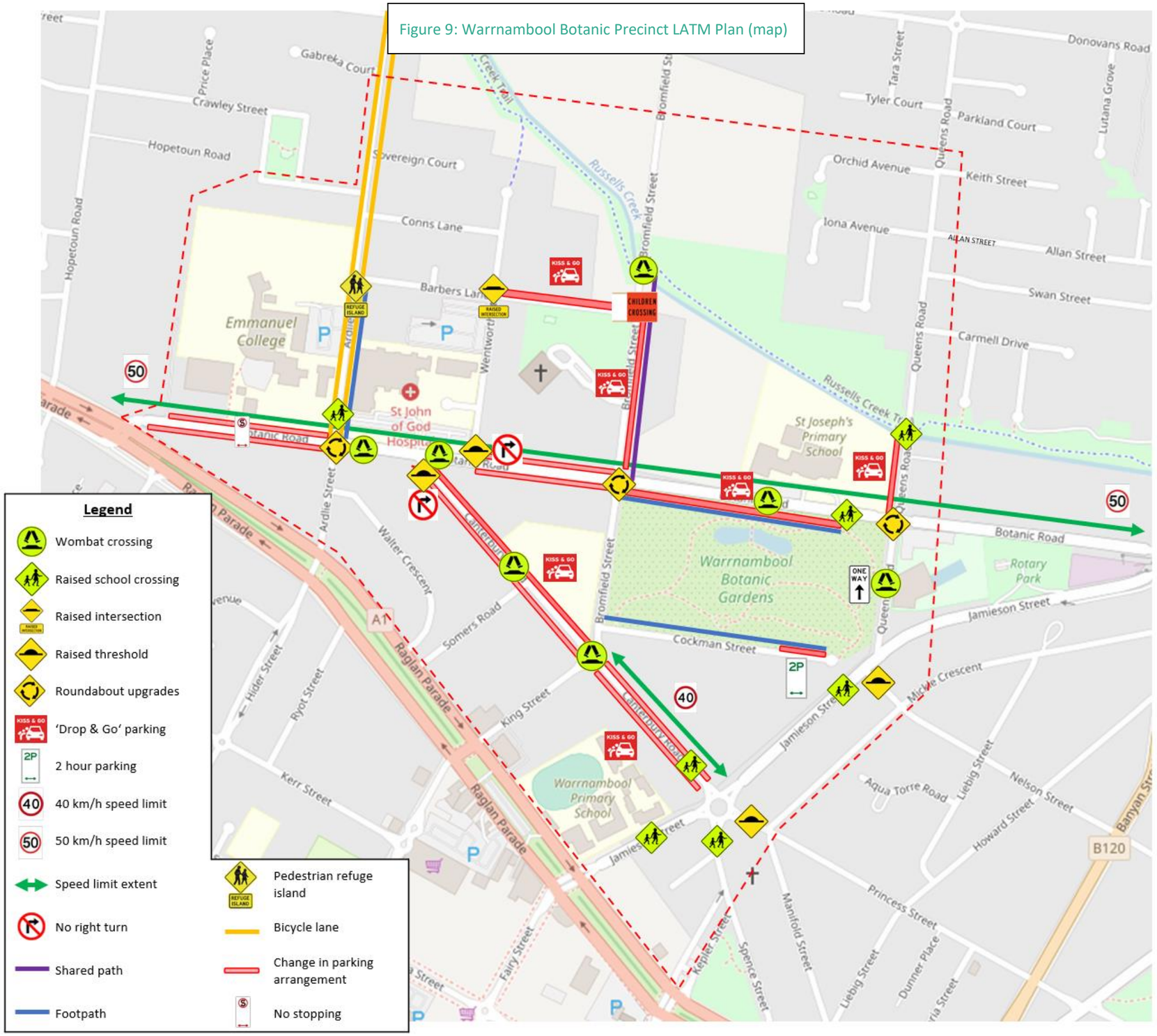

Figure 10: Warrnambool Botanic Precinct LATM Plan (map register)

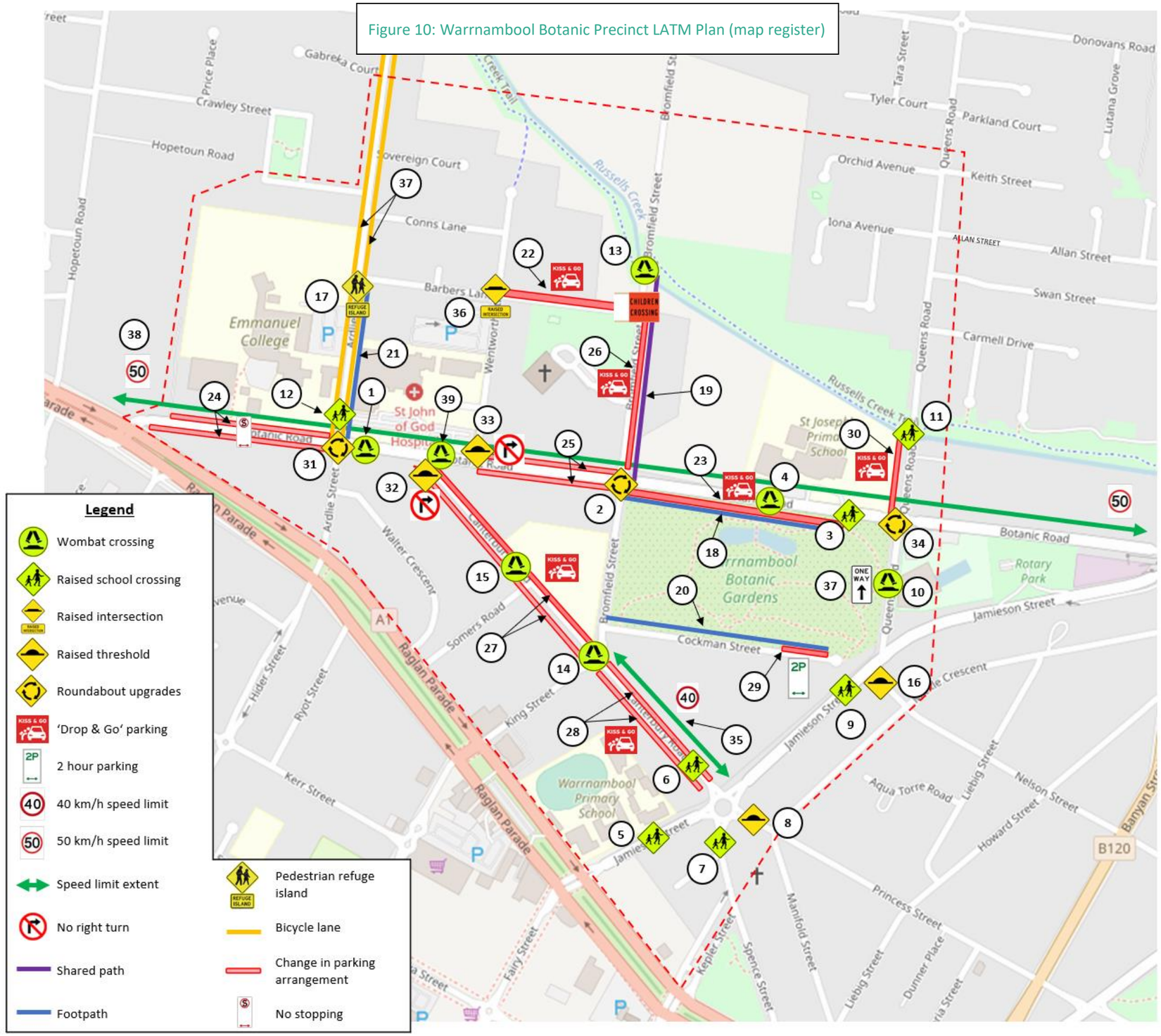

Table 2: LATM Plan – list of recommended treatments

	Map Ref	Icon	Road	Location	Proposed Treatment	Alternative Treatment
Walking	1		Botanic Rd	East of Ardlie St	Wombat crossing - to replace existing pedestrian refuge island (at roundabout)	
	39		Botanic Rd	East of Canterbury Rd	Wombat crossing	
	2		Botanic Rd	West of Bromfield St	Raised platform or speed cushions	
	2		Botanic Rd	East of Bromfield St	Raised platform or speed cushions	
	3		Botanic Rd	West of Queens Rd	Raised school crossing – to replace existing school crossing	
	4		Botanic Rd	Between Bromfield St and Queens Rd	Wombat crossing – located midblock	Locate crossing closer to Bromfield Street
	5		Jamieson St	Between Raglan Pde and Canterbury Rd	Raised school crossing - to replace existing school crossing	
	6		Canterbury Rd	North-west of Jamieson St	Raised school crossing - to replace existing school crossing	Wombat crossing if warranted
	7		Spence St	South of Jamieson St	Raised school crossing - replace existing school crossing and locate as close to Jamieson St as practicable	Wombat crossing if warranted
	8		Princess St	South-east of Jamieson St	Raised platform or speed cushions at/near existing crossing location	Wombat crossing if warranted
	9		Jamieson St	South-west of Nelson St	Raised school crossing - to replace existing school crossing	Wombat crossing if warranted
	10		Queens Rd	Midway between Jamieson St and Botanic Road	Wombat crossing	Other speed calming treatments on Queens Rd
	11		Queens Rd	Russell Creek Trail	Raised school crossing - to replace existing school crossing	Wombat crossing if warranted
	12		Ardlie St	North of Botanic Rd	Raised school crossing - to replace existing school crossing	Wombat crossing if warranted
	-	CHILDREN CROSSING	Bromfield St	North of Barbers Lane	Retain existing school crossing	Raise school crossing OR Combine with Russell Creek Trail crossing and provide a single wombat crossing
	13		Bromfield St	Russell Creek Trail	Wombat crossing – to replace existing crossing with pedestrian refuge	Combine with nearby school crossing and provide a single wombat crossing
	-		Barbers Lane	West side of Bromfield St	Retain existing raised threshold treatment	
	14		Canterbury Rd	Bromfield St/King St	Wombat crossings on all legs of roundabout	Raised platforms or speed cushions on approaches
	15		Canterbury Rd	Somers Rd	Wombat crossing immediately north of Somers Rd	Raised platform or raised intersection at Canterbury/Somers
	16		Nelson St	Jamieson St	Raised threshold crossing	
	17	REFUGE ISLAND	Ardlie St	South of Barbers Lane	Pedestrian refuge island	Wombat crossing if warranted
	18		Botanic Rd	Bromfield St to bus stop west of Queens Rd	New footpath on south side	
	20		Cockman St	Full length	New footpath on north side	
	21		Ardlie St	Botanic Rd to Barbers Lane	New footpath on east side	

	Map Ref	Icon	Road	Location	Proposed Treatment
Cycling	19		Bromfield St	Botanic Rd to Russell Creek Trail	New shared path on east side
	-		-	• Botanic Rd/Ardle Street • Botanic Road/Bromfield Street • Canterbury Road/Bromfield Street	Sharrows at roundabouts that do not have them
	37		Ardlie St	North of Botanic Rd	On-road cycle lanes on Ardlie St north of Botanic Rd

	Map Ref	Icon	Road	Location	Proposed Treatment
Parking	22	KISS & GO	Barbers Lane	Wentworth St to Bromfield St	Indented parking on north side with school drop-off/pick-up restrictions
	23	KISS & GO	Botanic Rd	Bromfield St to bus stop west of Queens Rd	Indented parking on south side with school drop-off/pick-up restrictions
	24		Botanic Rd	Raglan Pde to Ardlie St	Ban parking to stop parked vehicles obstructing the bike lanes
	25		Botanic Rd	Wentworth St to Bromfield St	Indented parking on both sides to stop parked vehicles obstructing the bike lanes
	26	KISS & GO	Bromfield St	Botanic Rd to tennis courts	Implement school drop-off/pick-up parking zone on east side
	27	KISS & GO	Canterbury Rd	Botanic Rd to Emmanuel College	Indented parking on one or both sides with school drop-off/pick-up restrictions
	28	KISS & GO	Canterbury Rd	Jamieson St to King St	Implement school drop-off/pick-up restrictions on one or both sides
	29	2P	Cockman St	North side, eastern end	Implement restrictions (eg. 2P) to deter all day parking
	30	KISS & GO	Queens Rd	Botanic Rd to Russell Creek Trail	Implement school drop-off/pick-up parking zone on west side

	Map Ref	Icon	Road	Location	Proposed Treatment	Alternative Treatment
Traffic	31		Botanic Rd	Ardlie St	Raised platforms on approaches Enlarge central island and install kerb outstands	Speed cushions on approaches
	32		Botanic Rd	Canterbury Rd	Raised threshold on Canterbury Ban right turn from Canterbury to Botanic	
	33		Botanic Rd	Wentworth St	Raised threshold on Wentworth Ban right turn from Wentworth to Botanic	
	2		Botanic Rd	Bromfield St	Raised platforms on approaches Enlarge central island and install kerb outstands	Speed cushions on approaches
	34		Botanic Rd	Queens Rd	Raised platforms on approaches Enlarge central island and install kerb outstands	Speed cushions on approaches
	35	40	Canterbury Rd	Jamieson St to King St	Implement 40 km/h speed limit	
	36	RAISED INTERSECTION	Wentworth St	Barbers Lane	Raised intersection	
	37	ONE WAY	Queens Road	Jamieson St to Botanic Rd	One way traffic	
	38	50	Botanic Road	Raglan Pde to Hopkins Hwy	Implement 50 km/h speed limit	

Table 3: Overview of treatment options

	Advantages	Disadvantages	Safety Benefit	Cost
 **Wombat Crossing** Consists of a raised platform to the same level as the adjacent pedestrian footpaths, with Pedestrian Crossing (Zebra) pavement markings on top. Requires speed hump warning sign and 20km/h advisory speed sign. May include flashing lights and other warning signs such as children crossing if warranted This treatment gives priority to pedestrians **at all times**.	• Effective at reducing vehicle speeds at crossing point • Considered a Safe System treatment as it reduces crash severity • Can be perceived as providing route continuity and coherence • Enhances visibility of the pedestrian crossing • Deterrent to through traffic	• More expensive than standard Pedestrian Crossing (Zebra) (construction, drainage etc.) • May increase traffic noise • May need modifications if on bus or freight routes • Can be uncomfortable for cyclists to negotiate	★★★★★	$$$$$
 **Raised School Crossing** Consists of a platform raised to the same level as the adjacent pedestrian footpaths. Requires speed hump warning, 20km/h advisory speed sign and red and white striped posts for children crossing flags. May include other warning signs, if warranted such as children crossing. Also includes stop lines for vehicles in advance of the crossing. Depending on location, this is usually accompanied by 40km/h school speed zones. This treatment give priority to pedestrians **only** when flags are displayed.	• Considered a Safe System treatment as it reduces crash severity • Effective at reducing vehicle speeds at crossing point • Outside of school times this operates as a speed hump • Positively perceived by parents • May have better visibility than standard children's crossing • Can be perceived as providing route continuity and coherence • Deterrent to through traffic	• Does not give priority outside of school times • May increase traffic noise • May need modifications if on bus or freight routes • Can be uncomfortable for cyclists to negotiate • More expensive than standard children's crossing (construction, drainage etc.) • Requires recruitment process for supervisors (and funding)	★★★★★	$$$$$
 **Pedestrian Refuge** Consists of a short stretch of raised median in the centre of the road that creates a staging point for pedestrians. Usually features a walkthrough at pavement level.	• Improves crossing opportunities for pedestrians by allowing them to focus on one direction of traffic at a time • Reduces the crossing distance for slower pedestrians • When used at an intersection (i.e. as a splitter island) it controls vehicle turning movements – both speed and alignment • Can act as a traffic calming measure	• Constrains swept paths/turning envelopes, making it more difficult for vehicles to perform turning movements • Reduces usable road width	★★★★★	$$$$$
 **Raised Intersection** Consists of a raised platform on the intersection and short length of approach roads. Requires speed hump warning, advisory speed sign and may include other warning signs, if warranted such as children crossing. May also need to be lit, depending on location.	• Effective at reducing vehicle speeds at crossing point • Considered a Safe System treatment as it reduces crash severity • Raises awareness levels of drivers	• Can be expensive (construction, drainage etc.) • Comfort level for commercial and heavy vehicles can be compromised • Does not provide priority for pedestrians	★★★★★	$$$$$
 **Raised Threshold** Consists of a platform raised to the same level as the adjacent pedestrian footpaths. Requires speed hump warning sign, 20km/h advisory speed sign and may include other warning signs, if warranted, such as children crossing. This treatment does **not** give priority to pedestrians or cyclists.	• An important element for providing continuity of pedestrian/cycle paths • Effective at reducing vehicle speeds at crossing point • Considered a Safe System treatment as it reduces crash severity • Deterrent to through traffic • Pedestrians are more visible to drivers	• Does not give priority outside of school times • May appear to path users that they have priority • May increase traffic noise • Can be unpopular with local residents • May need modifications if on bus or freight routes • Can be uncomfortable for cyclists to negotiate	★★★★★	$$$$$
 **Drop Off Points** Parking restrictions that allow a two-minute (or similarly short time) stop to drop off children. Driver remains with the car. Must be accompanied by a standard no parking sign to give it legal force.	• Requires indiscriminate parking and stopping to create a more orderly traffic environment • East to install and low cost	• Encourages driving over active transport • Relies on enforcement to be effective	★★★★★	$$$$$

	Advantages	Disadvantages	Safety Benefit	Cost
 **Roundabout Upgrades** Raised platforms or speed cushions on approaches, central island enlargement and kerb realignment to reduce the speed of traffic approaching and travelling through roundabouts.	• Reduce vehicle speeds and therefore the likelihood and severity of crashes within roundabouts • Improve safety for pedestrians using pedestrian crossing points • Improve safety for cyclists riding through roundabouts • Deterrent to through traffic	• Can be expensive (construction, drainage etc.) • May need modifications if on bus or freight routes • Reduced comfort level for motorists • Can be uncomfortable for cyclists to negotiate (raised platforms) • Noise	Site-specific	$ $ $ $ $
 **Shared Paths** Wide paths shared by pedestrians and cyclists, separated from vehicular traffic.	• Improve safety by separating vulnerable road users from vehicular traffic • Can influence desire lines (i.e. preferred routes), keeping pedestrians and cyclists on safer routes and crossings • Usually provides a more pleasant walking/riding experience, particularly through parks and other vegetated areas	• Can lead to conflict between cyclists and pedestrians • Off-road sections could be perceived as less safe (e.g. stranger danger) • Very high cost	★ ★ ★ ★ ★	$ $ $ $ $
 **On-Road Bicycle Lanes** Dedicated space for cyclists to the left of the traffic lanes, marked by signs and pavement markings.	• Provide space for cyclists to ride clear of moving traffic • Easy to install and low cost	• Significant safety risks remain, including car dooring and conflicts between cyclists and vehicles encroaching the bicycle lane	★ ★ ★ ★ ★	$ $ $ $ $
 **Separated Bicycle Lanes** Protect cyclists by positioning them between the parking or traffic lane and the footpath, with physical separation from through traffic and/or parked vehicles.	• Improves safety by preventing vehicular access to the bicycle lane and providing clearances for the opening of car doors • Generally provide a higher level of service for cyclists and promote increased patronage on cycling routes (compared to unprotected on-road bicycle lanes) • Maintain directness of travel and priority at intersections • May be applied in urban areas where parking is prevalent or where there is insufficient space for an off-road path	• Can be expensive (construction, drainage etc.) • Frequent maintenance is required to ensure that they do not accumulate debris and litter • Difficult to apply where there are frequent driveways or intersections • Require more space than unprotected on-road bicycle lanes	★ ★ ★ ★ ★	$ $ $ $ $

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Appendix A: Road Network

Road	Section	Hierarchy	Description
Ardlie Street	Raglan Parade Botanic Road	Access	One lane in each direction Cycle lane in each direction Footpath both sides 50 km/h speed limit; 40 km/h school zone
Ardlie Street	Botanic Road Barbers Lane	Collector	One lane in each direction No cycle lanes No footpath on east side for most of length 50 km/h speed limit; 40 km/h school zone
Botanic Road	Ardlie Street Queens Road	Link	One lane in each direction Cycle lane in each direction Footpath both sides, except adjacent to Botanic Gardens 60 km/h speed limit; 40 km/h school zone
Bromfield Street	Canterbury Road Botanic Road	Access	One lane in each direction No cycle lanes Footpaths on both sides 50 km/h speed limit; 40 km/h school zone
Bromfield Street	Botanic Road Barbers Lane	Collector	One lane in each direction No cycle lanes No footpath on east side 50 km/h speed limit; 40 km/h school zone
Cockman Street	Bromfield Street Jamieson Street	Access	One lane in each direction No through road No cycle lanes No footpath on north side (adjacent to Gardens) 50 km/h speed limit
Jamieson Street	Raglan Parade Queens Road	Link	One lane in each direction Cycle lane in each direction Diagonal parking south of Princess Street Parallel parking north of Princess Street Footpath on both sides 50 km/h speed limit; 40km/h school zone
Queens Road	Jamieson Street Botanic Road	Access	One lane in each direction No cycle lanes Footpath both sides 50 km/h speed limit; 40 km/h school zone
Queens Road	Botanic Road Carmell Drive	Collector	One lane in each direction No cycle lanes Footpath both sides 50 km/h speed limit
Canterbury Rd	Botanic Road Jamieson Street	Collector	One lane in each direction No cycle lanes Footpath on both sides Speed limit 40 km/h (west of Bromfield Rd) Speed limit 50 km/h (east of Bromfield Rd); 40km/h school zone
Raglan Parade	Ardlie Street Jamieson Street	Arterial	Dual carriageway, two lanes in each direction Cycle lane in each direction Footpath on both sides 60 km/h speed limit
All other Roads	N/A	Access	
Road Hierarchy Functions are defined in Section 3.1			

Appendix B: Community Engagement Summary of Issues

WALKING –		
Issue	Location and description	Suggestions
Use of footpath	Bromfield Road – no footpath along most of east side.	Install footpath Install shared path
Use of footpath	Ardlie Street north of Botanic Road – no footpath on east side.	Install footpath Install shared path (both sides)
Use of footpath	Botanic Road at St Joseph's – no footpath alongside Botanic Gardens. During school drop-off pick-up times heavy vehicle and pedestrian traffic raises exposure to risks.	Install footpath Install shared path
Use of footpath	Queens Road – concerns about the gradient of the footpath.	
Crossing at mid-block	Ardlie Street – no crossing for students to/from Barbers Lane	Install crossing
Crossing at mid-block	Botanic Road at St Joseph's – crossing during peak times is very difficult/risky.	Install additional crossing or move existing crossing Reduce speed limit to permanent 40 km/h Reduce traffic volumes
Crossing at mid-block	Queens Road – no convenient crossing point to connect Aquazone with Botanic Gardens.	Install crossing Engage support from 'Friends of the Gardens'
Crossing at mid-block	Warrnambool Primary School – children crossing unsupervised and not at school crossing.	
Crossing at intersection	Botanic Road/Queens Road roundabout – difficult to cross (and fast vehicles).	
Crossing at intersection	Botanic Road/Ardlie Road roundabout – perceived risks.	
Crossing at intersection	Botanic Road/Canterbury Road – T-perceived risks.	
Crossing at intersection	Botanic Road/Bromfield Road roundabout – perceived risks.	Install crossings
Crossing at intersection	Bromfield Road/Canterbury Road roundabout – perceived risks and difficulty crossing when traffic backs up.	
Crossing at intersection	Ardlie Road, at Raglan Parade - no pedestrian facilities for crossing Ardlie Road.	Advocate for intersection upgrade
General: • School crossings are largely meeting needs • Emmanuel College - need better connection between junior campus and senior campus. • Encourage park and walk (e.g. Café Lava offer discounts) • Raglan road is very hard to cross at Ardlie Street and Botanic Road. • Install a new crossing on Bromfield Street • Bromfield Road culvert over Russell Creek – widen to allow for footpath. Desirable. • Active transport is a culture change (and ongoing maintenance) issue		

CYCLING		
Issue	Location and description	Suggestions
Mid-block safety	Botanic Road at St Joseph's – pick-up traffic parks in cycle lane.	
Mid-block safety	Botanic and Queens Road – steep gradients.	
Intersections	Roundabouts are perceived as a hazard	Discourage cycle and vehicles from entering roundabouts side by side. Narrow approach and add sharrows.
Cycle parking	Botanic Gardens – no cycle racks.	Install cycle racks at entrance to Botanic Gardens.
Cycling through Botanic Gardens	Some students ride through the gardens in an inappropriate way.	Work with students and friends of the gardens to develop a strategy to assist students moving through the gardens in a safe manner.
General: • Schools generally well served by bike paths • Active transport is a culture change (and ongoing maintenance) issue.		
DRIVING/RIDING		
Issue	Location and description	Suggestions
Difficult intersections	Canterbury Road/Botanic Road - right turn onto Botanic Road and conflict with traffic entering/leaving St John's Hospital.	
Difficult intersections	Bromfield Road/Canterbury Road roundabout – sightlines are inadequate/obstructed.	
Obstructions to movement	Botanic Road - cars backed up at St. Joseph's left turning lane impedes traffic on Botanic Road and impedes traffic on Bromfield Road approaching the roundabout from the north.	
Obstructions to movement	School crossings – slow up traffic and cause congestion	
Speeding	Jamieson Street, Warrnambool Primary – speeding at school times and sometimes through the school crossing.	Permanent 40 km/h speed limit
General: • There is confusion around all of the different speed zones – 40/50/60 km/h		
PARKING		
Issue	Location(s) and description	Suggestions
Insufficient capacity	Emmanuel College – insufficient parking for drop-off and pick-up.	Create a park and walk facility in Barbers Lane between Wentworth Street and Bromfield Street

		Create a park and walk facility along Canterbury Road with parallel parking set-back into nature strip; other opportunities at Somers Road and Spence Street
Insufficient capacity	St. Joseph's Primary School – insufficient parking for drop-off and pick-up. Results in inappropriate stopping and use of Aquazone carpark.	Create a park and walk facility on Queens Road north of Carmell Drive. Create a park and walk facility on Bromfield Street adjacent to Botanic Gardens. Also Mickle Crescent.
Insufficient capacity	Botanic Gardens – is very busy on Sundays. Need more parking.	Install dedicated parking facilities on Bromfield Road. Increase parking at the school oval.
Unsafe manoeuvres	Warrnambool Primary – U-turns, running school crossings.	
Inappropriate parking	Cockman Street – Emmanuel College students park here which is seen as undesirable .	Introduce restricted parking times on Cockman Street and use as drop-off/pick-up zone.
Inappropriate parking	Barbers Lane – parking on verge close to fence impedes pedestrians.	Create dedicated park and walk facility.
General: • School staff are parking in Canterbury Road • Need more park and walk facilities		
PUBLIC TRANSPORT		
Issue	Location(s) and description	Suggestions
School Bus	There is (or there should be?) a dedicated bus to Warrnambool Primary School. *[Check with Nic]*	
Tour Bus	Jamieson Street – bus stop at Queens Road is for tour bus, but drivers do not always use it and get lost looking for entrance to Garden's	Communicate with tour bus operator.
General: • Patronage of buses is poor. • Are bus routes appropriate for the journey's people want to make? • Active transport is a culture change (and ongoing maintenance) issue.		
NOTES: - Issues and descriptions are a record of community and stakeholder perceptions - Suggestions were not given for all issues - Community feedback on issues outside of the scope of study are not recorded above		

Appendix C: Examples of Proposed Treatments

Photo 1: Wombat crossing – Koroit Street, between Liebig Street and Banyan Street

Photo 2: Raised school crossing – Merrivale Drive near Merrivale Primary School

Photo 3: Raised local intersection

Photo 4: Raised threshold treatment – intersection of Merri Street and Annes Lane

Photo 5: Roundabout upgrade – intersection of Banyan Street and Merri Street

Photo 6: Sharrows – intersection of Banyan Street and Merri Street

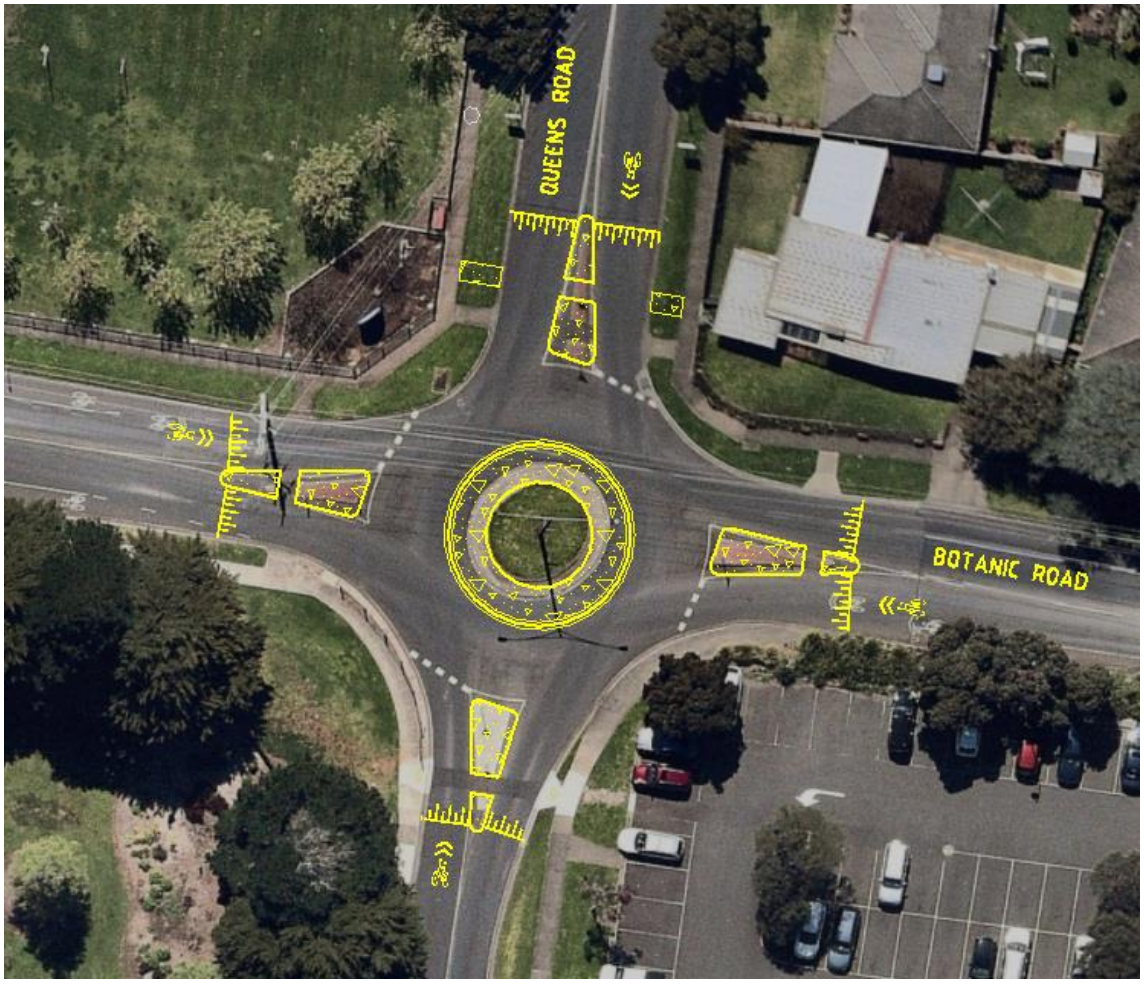

Figure 11: Botanic Road / Queens Road roundabout upgrade concept
(note enlarged central island and splitter islands, raised pavement and sharrows)

Photo 7: Indented parking – Merri Street near Annes Lane

Photo 8: Shared path

Photo 9: Separated bicycle lane

Photo 10: Pedestrian refuge